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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,272	10/15/2003	Markus Donald Herrema	Herrema	9959

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EXAMINER

KOSSON, ROSANNE

ART UNIT PAPER NUMBER

1651

DATE MAILED: 09/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/687,272

Applicant(s)

HERREMA, MARKUS DONALD

Examiner

Rosanne Kosson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, the claimed method requires that methane from a cow's breath be used to grow methane-utilizing (methylophilic) microorganisms. There is no evidence on the record, however, for example experimental data, that methane taken from a cow's breath produced a grown culture of a methylophilic microorganism. There is no evidence that if the apparatus described in the application, including one or more methylophilic microorganisms and culture medium, were placed on a cow, that the methylophilic microorganisms would grow better if a cow's exhaled breath were pumped into the chamber containing the microorganisms than if the chamber were exposed to unadulterated air. Also, as no indication of the concentration of methane needed to practice the claimed invention is provided, there is no indication as to whether or not the microorganisms would grow if the chamber were simply mounted on the cow without the cow's breath pumped in. In view of the foregoing, and because no working examples have been provided, one of skill in the art at the time that the

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application was filed would not have been able to determine whether or not the claimed method is operational as described, or whether additional work is required to complete the concept. It is clear that in order to practice the scope of the claimed subject matter, the skilled artisan would have expected to have undertaken essentially a trial and error process. Such a process clearly amounts to undue experimentation. Because the specification does not demonstrate that the claimed invention works, the skilled artisan clearly would have expected to have to experiment unduly to practice the claimed invention. In sum, undue experimentation would be required to practice the invention as claimed due to the quantity of experimentation necessary; limited amount of guidance and limited number of working examples in the specification; nature of the invention; state of the prior art; relative skill level of those in the art; predictability or unpredictability in the art; and breadth the claims (In re: Wands, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988)). A holding of non-enablement is, therefore, clearly required.

Claim 3 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a methane conveyance means that is powered by a battery, does not reasonably provide enablement for a methane conveyance means that is powered by any other power source, such as solar, water, wind, etc. or another "functional source of power." The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. Specifically, claim 3 includes any means of generating power for the methane conveyance means. This claim language

compasses a multitude of possible power sources, including power sources neither contemplated nor disclosed by the specification as filed and for which Applicant has provided no guidance for their design, construction, feasibility or practicality. Such sources are particularly important for non-mechanical power sources for which energy must be harnessed and converted, e.g., solar, water, wind, methane and methane-derived energy, as well as an "other functional source of power." In view of the great extent of the claimed subject matter, combined with the fact that the specification as filed provides a description of only a limited amount of guidance (the battery-powered methane conveyance means), it is clear that in order to practice the scope of the claimed subject matter, the artisan of ordinary skill would have expected to have undertaken essentially a trial and error process. Such a process clearly amounts to undue experimentation. Because the specification provides no guidance as to how to select, design, make and incorporate power sources apart from the battery, the skilled artisan clearly would have expected to have to experiment unduly to practice the claimed invention. In sum, undue experimentation would be required to practice the invention as claimed due to the quantity of experimentation necessary; limited amount of guidance and limited number of working examples in the specification; nature of the invention; state of the prior art; relative skill level of those in the art; predictability or unpredictability in the art; and breadth the claims (In re: Wands, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988)). A holding of non-enablement is, therefore, required.

Claim 3 may be amended to recite: "The method of claim 2, wherein said conveyance means includes any means powered by a battery."

Claim 7 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 7 recites that the microorganisms, growth medium and methane are "independently exposed" in a fermentation process. The drawings, however, do not show a design and the specification does not describe a method in which any of these three components are independently exposed to anything. The specification also provides no guidance for the construction or use of an apparatus in which the microorganisms, the growth medium or the methane would be exposed independently to a particular object, chemical compound or cell. Consequently, it is clear that in order to practice the claimed invention, one of skill in the art would have expected to have undertaken essentially a trial and error process to construct an apparatus to practice the method of claim 7. Such a process clearly amounts to undue experimentation.

Because the specification and drawings provide no guidance as to how to design and make an apparatus in which the microorganisms, growth medium and methane are "independently exposed" in a fermentation process, the skilled artisan clearly would have expected to have to experiment unduly to practice the claimed invention. As a result, a holding of lack of enablement is required. Applicant may wish to cancel this claim.

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Claim 9 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 9 recites "other microorganisms which promote the growth of said methane-utilizing microorganisms." Although the specification discloses that methane-utilizing (methylophilic) microorganisms are well known in the art of microbiology (see p. 3, last paragraph), it does not teach that other organisms may be grown along with the methylophilic organisms to improve their growth. The specification discloses that *Methylococcus capsulatus* may be placed and grown in the apparatus used in the claimed method, but it does not disclose combining this organism with one or more additional organisms. Thus, the specification provides no guidance for selecting one or more compatible additional organisms or for incorporating such organisms into the apparatus. The specification also does not teach that combining a methylophilic organism with one or more additional organisms is beneficial or desirable. As a result, a holding of lack of enablement is required. Applicant may wish to cancel this claim.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3, 7, 11 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

In claim 1, step a. recites “providing methane gas that has been exhaled through ruminant animal exhalation.” This step includes using air into which cows have exhaled that is distant from the apparatus in the claimed method, because in the claimed method, methane is not purified from the cow’s breath to any degree and supplied to the apparatus. Step a. may be amended to recite: “a. collecting methane gas that has been exhaled through ruminant animal exhalation.”

Claim 3 recites an “other functional source of power.” This phrase is not defined in the specification, rendering the meaning of the claim unclear, as it cannot be determined what Applicant intends to include in or exclude from the claim. As discussed above, and in view of the rejection for lack of enablement above, claim 3 may be amended to recite: “The method of claim 2, wherein said conveyance means includes any means powered by a battery.”

Claim 7 recites that the microorganisms, growth medium and methane are “independently exposed” in a fermentation process. The phrase “independently exposed” is not defined in the specification, rendering the meaning of the claim unclear. To what are these three components independently exposed? It cannot be determined what means causes any or all of the three components to be independently exposed to something else. For example, if each of the three components, as represented by part nos. (92), microorganisms, (93), medium, and (72), methane, may be exposed independently to the microorganism growth capsule pipe (80) shown in Figure 3A, such independent exposure means is not disclosed in the specification or drawings. Applicant may wish to cancel this claim.



Claim 11 recites that the microorganisms are “either new or have been previously exposed.” The word “new” is not defined in the specification and is indefinite, because it can mean a different kind, or it can mean cultured apart from the apparatus and/or the cow, or it can have yet another meaning. Claim 11 may be amended to recite: “The method of claim 10 wherein said microorganisms either have or have not been previously exposed in said mutual-exposure means.”

Claim 12 recites that the microorganisms to be used are determined “in accordance with the environmental factors in which they are expected to grow, including factors such as ... .” The term “in accordance with” is indefinite, rendering the meaning of the claim unclear, because it does not delineate the relationship between a particular environmental factor and growth. The phrase “such as” renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d). Further, the terms “environmental factors,” “temperature,” and “density” do not appear in the specification, although the specification notes, as discussed above, that multiple methylotrophic microorganisms are well known. Thus, one of skill in the art would have recognized that, where methylotrophic microorganisms differ in their optimal growth conditions, the microorganism(s) best suited to the conditions at hand would have been selected. Claim 12 may be amended to recite: “The method of claim 1, wherein the type of methane-utilizing microorganisms to be used in the confined apparatus is determined by one or more factors selected from the group consisting of the amount of growth desired, methane availability and nutrient availability.”

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Lastly, in amending the claims, Applicant may wish to have all the claims uniformly recite either a process or a method in the preamble.

The prior art does not anticipate or reasonably suggest a method for producing methane-utilizing microorganisms in which methane exhaled in a cow's breath is used as a carbon source or in which the exhaled breath from a cow is collected and conducted to a growth chamber containing methylotrophic microorganisms. Claims that have not been specifically addressed above are rejected as being dependent from one or more rejected base claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosanne Kosson whose telephone number is 571-272-2923. The examiner can normally be reached on Monday-Friday, 8:30-6:00, with alternate Mondays off.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rosanne Kosson  
Examiner  
Art Unit 1651

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2004-09-16



FRANCISCO PRATS  
PRIMARY EXAMINER